

QUARTERLY REPORT
JULY - SEPTEMBER 1993

MODIS TEAM MEMBER
STEVEN W. RUNNING
NASA CONTRACT NAS5-31368

ASSOC. TEAM MEMBERS
E.RAYMOND HUNT, RAMAKRISHNA R. NEMANI

Activities of Team Member S. W. Running

Algorithm Theroetical Basis Documents (ATBDs) Ray, Rama and I produced ATBDs for our leaf area index (LAI) and fraction absorbed photosynthetically active radiation (FPAR) products, and our photosynthesis(PSN)-net primary production (NPP) products, and submitted these in Sept 1993.

EOS-LTER interaction

S. W. Running attended the NSF LTER meeting in Estes Park, Colorado in Sept 1993. He chaired a workshop designing the protocol for a collective proposal from the LTER participants to establish the network of field validation sites for MODLAND products. The site sub-proposals are due to Warren Cohen on December 1, for assembly into the final proposal, joint to NASA and NSF in Winter 1994.

BOREAS

S. W. Running attended the BOREAS Science Team meeting in October 1993 at CoolFont Virginia. (Dorothy Hall and Alan Strahler also attended from MODLAND). S. W. Running is working on plans to coordinate a modeling program as part of BOREAS science.

MODLAND Journal Paper

S. W. Runnning finished reviewer and editorial revisions for the MODLAND journal paper to Int. J. Remote Sensing, and submitted revised copy to John Townshend. Copies to all MODLAND co-authors will be sent by mid-November.

Global Landcover

During the period 1 April - 1 August S. W. Running was a visiting scientist at the Dept of Plant Ecology of Lund University, Lund Sweden. There I worked with I. C. Prentice on advanced logic for global landcover classifications, a key global MODLAND product. A paper on this work has been submitted to Remote Sensing of Environment.

Activities of Assoc Team Member E. R. Hunt

For the quarter from July 15 through October 15, 1993, E. Raymond Hunt's major activities were as follows. In collaboration with scientists from Canada, I studied the relationship between SAR backscatter and forest stand parameters to determine if SAR may provide important ancillary data for MODIS algorithms. I am also continuing to write up Mr. Agus Hidayat's thesis on combining AVHRR-NDVI data with BIOME-BGC simulations for a tropical forest, a globally important ecosystem. I also made two important presentations. One was to the Ecological Society of America and one was an invited seminar on my continuing work on BIOME-BGC development. Finally, I attended the FIFE Science Workshop in Manhattan, Kansas. Use of the FIFE data set to test BIOME-BGC is a high priority for MODIS algorithm development. The invited seminar was at Oak Ridge National Laboratory, which is the site of the EOS Land-DAAC. Recently, I was appointed to the Oak Ridge Land DAAC Science Advisory Group. Some time was spent discussing possible historic data sets which may be saved by the DAAC. However, most of my time was spent discussing possible collaboration with the Walker Branch Throughfall Displacement Experiment. This manipulation experiment may be our best opportunity to rigorously test BIOME-BGC for a deciduous broadleaf forest ecosystem.

Publication Activity (ERH)

Hidayat, A. & E. R. Hunt, Jr., In preparation. Relationship of AVHRR-NDVI to seasonal drought for a tropical forest in Ujung Kulon, Indonesia. International Journal of Remote Sensing.

Wilson, B.A., S.E. Franklin, M.B. Lavigne, & E.R. Hunt, Jr., Submitted. Estimating balsam fir forest stand conditions using ERS-1 SAR data. Canadian Journal of Remote Sensing

Presentations (ERH):

Hunt, E.R., Jr., 1993. Generalization of a conifer ecosystem model to other ecosystems, BIOME-BGC: Application to local and global carbon budgets. Invited seminar to the Environmental Sciences Division, Oak Ridge National Laboratory.

Hunt, E.R., Jr. & S.W. Running, 1993. BIOME-BGC: Modelling soil N and C dynamics of different ecosystems and validation with micrometeorological data. Bulletin of the Ecological Society of America 74 (suppl): 286-287 (abstr).

Activites of Assoc. Team Member R.R.Nemani

Proto-type versions of algorithms for deriving FPAR and LAI from MODIS data were developed. A sensitivity analysis of various parameters in the algorithms is being undertaken using a 3-D canopy radiation model. We are also exploring the use of MODIS data from middle infrared wavelengths for extracting canopy biophysical parameters. The utility of surface temperature observations from air and space borne sensors is being investigated in land cover classification. Surface temperature was found to be strongly controlled by fraction of vegetation cover. Different biomes with their inherent canopy geometric properties produce differential plant cover, which leads to large differences in observed surface temperature. Therefore, we believe surface temperature observations can contribute substantial information in separating various land cover classes.

R. R. Nemani attended the 4th International CO2 conference, Sept 12-17, in Carquaraine, France. He also attended the Workshop on Thermal Remote Sensing of the Energy and Water Balance over Vegetation, Sept 22-25, in La Londe Les Maures, France. Papers presented:

"Influence of surface and atmospheric conditions on the Ts/NDVI relation at the watershed scale." R. Nemani and S. Running.

"Land cover classification using the combination of spectral vegetation indices and surface temperature from AVHRR." R.Nemani and S. W. Running.